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Interventions for children with attention deficit hyperactivity disorder

Abstract

Attention Deficit Hyperactivity Disorder (ADHD) continues to be widely studied within the literature and researchers continue to investigate interventions and environments which allow for success. Whalen and Renker (1991) argue that multiple intervention methods are needed for success of children and adolescents in social situations. The purpose of this paper is to review the literature, and review interventions used to facilitate appropriate behaviors in children, aged six to eleven, with a diagnosis of attention deficit hyperactivity disorder.

Interventions for Children with
Attention Deficit Hyperactivity Disorder

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Chapter 1 Statement of The Problem

Attention Deficit Hyperactivity Disorder (ADHD) continues to be widely studied within the literature and researchers continue to investigate interventions and environments which allow for success. The Diagnostic and Statistical Manual of Mental Disorders IV (American Psychological Association, 1996) defines ADHD as a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequent and severe than is typically observed in individuals at a comparable level of development. This pattern of inattention and/or hyperactivity-impulsivity must persist for six months and meet at least six or more observable symptoms from the categories of inattention, hyperactivity, and impulsivity. Recommendations by the DSM-IV(1996) state that "It is especially difficult to establish the diagnosis of ADHD in children younger than age 4 or 5 years, because their characteristic behavior is much more variable than that of older children and may include features that are similar to symptoms of Attention-Deficit/Hyperactivity Disorder"(81).

According to Barkley (1997), ADHD occurs in approximately 3-7% of the childhood population and the disorder persists into adolescents in 50-80% of cases clinically diagnosed in childhood. With the large amount of ADHD carryover from childhood to adolescence, interventions are becoming a priority for researchers.

Whalen and Henker (1991) argue that multiple intervention methods are needed for success of children and adolescents in social situations such as

school, family, and peers. Goals of intervention, according to Blackman, Westervelt, Stevenson, and Welch (1991) are to reduce problem behaviors and prevent interference with learning. The purpose of this paper is to review the literature on attention deficit hyperactivity disorder, and review interventions used to facilitate appropriate behaviors in children, aged six to eleven, with a diagnosis of attention deficit hyperactivity disorder.

Chapter 2 Review of the Literature on Attention Deficit Disorder-Hyperactivity

A review of the research gave insight into the factors which allow a child with attention deficit hyperactivity disorder to control behaviors through a multitude of methods. Studies tend to focus on behavioral interventions (Abramowitz and O'Leary, 1991), stimulant treatment (DuPaul and Barkley, 1993), and cognitive interventions (Abikoff, 1991). Research studies that have focused upon various implications concluded that studies need to be performed to help clarify which stimuli operate as distracters and facilitators in children with attention deficit hyperactivity disorder (Abikoff, Courtney, Szeibel, and Koplewicz, 1996).

Historically, attention-deficit hyperactivity disorder was identified in 1987 by the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R). Attention-deficit hyperactivity disorder has had several names, from brain injured in the 1930s and 1940s, to minimal brain damage in the 1950s and early 1960s, in the late 1960s and 1970s hyperactivity was used for the first time, and in 1980 the term attention deficit disorder was used instead

of hyperactivity and two subtypes were given for the disorder by the DSM III (Reeve, 1990).

Core behavioral issues have remained constant over time with these behavioral issues being high activity level, inattention, and impulsivity (Blackman, Westervelt, Stevenson and Welch, 1991). Excessive motor activity is defined as not only intensity (loudness, frequency), but by the fact that it is variable (Zentall, 1993). If the motor activity is repetitive, then anxiety or autism may be a more suitable diagnosis because, according to Zentall (1993), ADHD children failed to repeat activity patterns for any significant time period. High distractibility shows through by inattention to tasks such as difficulty listening to important messages (Zentall, 1993). Impulsivity is defined by Zentall (1993) as a child's inability to withhold active responses because the child does not wait long enough to consider alternatives to his/her behavior. For example, blurting out statements and grabbing materials without thought or consideration to others in the group. Numerous problems among attention deficit disorder-hyperactivity children have been linked to behavior disorders. Externalizing conditions (Reeve, 1990), difficulty in social situations (Landau & More, 1991), and scholastic problems (Frick, Kamphaus, Lahey, & Loeber, 1995) are the major focus of literature on ADHD children. This author chooses to focus on various interventions used to help ADHD children control their behavior. Behavioral, psychostimulant, and cognitive interventions will now be reviewed.

Behavior Interventions with Children Exhibiting Attention Deficit Disorder-Hyperactivity

According to the behaviorist paradigm, appropriate behaviors are facilitated by environmental factors and are learned through experience (Liebert & Spiegler, 1994). Factors that distinguish behavioral interventions from other types of interventions are the situation specific behaviors and emphasis on learning and experience (Liebert & Spiegler, 1994). The major behavioral strategy used with children diagnosed as having attention deficit hyperactivity disorder is the contingency management system, used by Whalen & Henker (1991) and Anastopoulos, DuPaul and Barkley (1991).

Behavioral concerns of children with attention-deficit disorder focus around the control of motor activity level, distractibility, and attention span. Distinguishing children with attention deficit hyperactivity disorder from children without attention deficit hyperactivity disorder is difficult, especially for young children aged three to six years old. According to Blackman et al (1991), and Abikoff (1991), children with ADHD compared to their "normal" peers, tend to have a higher degree of activity, have more difficulty with directions, fail to complete tasks more often, have difficulty playing alone, disturb other children, and have excessive and inappropriate verbalizations.

In distinguishing differences between children with attention deficit hyperactivity disorder and children without attention deficit hyperactivity disorder, behaviors that all children must exhibit should be clearly outlined. Umbreit (1995) gives a universal definition of appropriate behavior as being on task and focused upon the material at hand and complying with teacher requests. Also, Umbreit defines appropriate behavior as engagement in

appropriate nonverbal social behavior with others. Children with attention deficit hyperactivity disorder have more trouble engaging in these behaviors than those children that are not diagnosed with attention deficit hyperactivity disorder.

Pelham (1993) states that treatment for attention deficit hyperactivity disorder should begin with behavioral settings. The behavioral settings most significant for the child are home and classroom. These settings are significant because the child is in both of these settings a major portion of the day. A child is required to exhibit similar behaviors in both home and school settings, so a congruence effect is desired. The most critical influences in these environments focus upon the parents in the home and teachers and peers in the school setting.

In the home, parents have the ability to make a significant impact upon a child's social development. According to Sheridan, Dee, Morgan, McCormick, and Walker (1996) parents are in an ideal position to provide training in natural settings around the home, as well as out in the community. Sheridan et. al. (1996) believe parents influence social skills development and are able to give immediate feedback to the child and prompt and reinforce skill usage immediately. Parents must always keep in mind that they (the parents) are learning methods which help them to cope with their child, and their child's disability.

Parents must be instructed on the behaviors their children exhibit that vary from the desired behavior. Reflection upon the children's behavior is critical because parents need to be able to distinguish which behaviors the child successfully exhibits and which behaviors need improvement. In order to

achieve this understanding, parents must adhere closely to the prescribed program and work with the child, teacher, and therapist to affect change within themselves as well as in their children (Anastopoulos, et. al.1991).

Teachers are the most valuable resource for information about the behaviors specific children exhibit. The teacher has daily contact with the child, and observes behaviors exhibited by others of the child's age, therefore teachers are able to identify the abnormal behaviors exhibited by those children with ADHD. Horn, Ialongo, Greenberg, Packard and Smith-Winberry (1990), and Ialongo, Horn, Pascoe, Greenberg, Packard, Lopez, Wagner, and Puttler (1993) suggest that social learning theory principles, such as manipulation of the environment, reducing the probability of maladaptive child behavior, and increasing the probability of adaptive child behavior, will have value in the therapy of children with attention deficit hyperactivity disorder. These principles are most effective in helping teachers and parents understand the manipulation of the child due to environmental factors and to decrease the amount of maladaptive behavior exhibited by children with attention deficit hyperactivity disorder.

In addition to those maladaptive behaviors children are exhibiting, parents must be told the appropriate behaviors their children should be exhibiting. These instructions are critical for parents and teachers. According to DuPaul & Ervin (1996), intervention strategies should teach alternatives to children. These intervention strategies should show the child more appropriate ways to access reinforcers associated with ADHD behaviors. DuPaul & Ervin (1996) argue that focusing on alternative behaviors requires the same or less effort than focusing on problematic behavior and increases

access to the desired reinforcer. Intervention designs should be able to change the antecedents in order to reduce the behaviors exhibited by ADHD children.

Whalen and Henker (1991) suggest that behavior interventions used with children diagnosed as having ADHD should be based upon contingency management systems where antecedents are reproducible. Antecedents include situations, time of day, and/or who is present when behaviors occur that cause or influence the ADHD child to act in a negative manner (Liebert & Spiegler, 1994). Reproducing antecedents will help in identifying what type of controls within the management system should be used for each individual child.

Contingency management, as a paradigm, focuses upon the application of consequences contingent on specified child behaviors (Abramowitz and O'Leary (1991). Abramowitz et. al. (1991) define contingency management as the application of consequences, which are contingent on problematic behaviors. Consequences for the child may include separation from the group (time-out), punishment, loss of tokens in token economy, along with others types of negative consequences. Behaviors that are the most problematic for the child to control are usually found across more than one setting (i.e. home, school, or peer relations). These behaviors may consist of staying on task, following instructions, or controlling motor activity such as getting out of their (the child's) seat at inappropriate times. These behaviors are specified by parents, teachers, or other professionals who are close to the child with attention deficit hyperactivity disorder. Based upon the problem behaviors found by parents, teachers, and so on, contingencies are used to help the child learn appropriate behavior.

Whalen & Henker (1991) suggest that contingency management systems have a higher success rate with children than any other intervention studied. This success rate may be due to the highly structured environments set by the school and home. Contingency management systems often require the changing of home and classroom settings as well as some form of parent and/or teacher training to ensure new rules and procedures are understood and the child's program is followed as written to help the child behave appropriately across all situations (Whalen et al. 1991).

Most researchers focusing upon the parents as change agents use contingency management systems to affect the child's behavior. Whalen, et al (1991) use cues or antecedents of problem behaviors to assess and treat the child. Assessments focus upon an array of target problems and situations for which treatment is focused. In the assessment phase, parents and teachers must first identify the behaviors that are problematic for the child. After identifying the behaviors, they then must observe the antecedents which cause the behavior. Once the behaviors and antecedents are identified, training of parents and teachers takes place. Training of parents and teachers is most critical to the process because training maintains consistency between the home and school settings. After the training, manipulation to decrease the antecedents take place and are monitored for effectiveness.

Abramowitz & O'Leary (1991) use token economies in the contingency management system. Token economies involve a reward for specific desirable behaviors and a cost component for undesirable behaviors. Tokens earned by the child for appropriate behaviors are then exchanged for activities, privileges, toys, candy, or any other positive reinforcer for the child.

This process must be closely monitored for effectiveness. If a child is losing more points than he/she is earning, the program should be modified as quickly as possible. The goal of this contingency management system is to shape higher rates of appropriate behaviors. In order to positively effect this type of change, children have to earn tokens, not lose them. This is one of the few types of contingency management approaches which focus upon the child as the major influence in the change process. Moving from child centered therapy, parent centered therapy is an alternative intervention for the child with attention deficit hyperactivity disorder..

Contingency management systems used by Anastopoulos et. al, (1991) include a series of six to twelve therapy sessions in either individual family or multifamily group format. Within the intervention, parents progress from an orientation to a booster session over the course of about ten weeks. The therapy sessions used with families follow specific training steps as outlined by Anastopoulos et. al. (1991). The following steps make up the contingency management intervention for parents of children with attention deficit hyperactivity disorder.

Program Orientation and Review of ADHD which revolves around history of ADHD, criteria for diagnosis such as symptoms and clinical measures, and treatment approaches used with ADHD children. This information is presented both visually using slides as well as in group discussions to aid in the understanding of the disorder. Step 2 involves Understanding Parent-Child Relations and Principles of Behavior Management. Parents learn about four major factors that can contribute to the emergence and/or maintenance of children's behavior. At this stage

parents learn general behavior management principles which relate to their child specifically and how situations may affect the behavior and the management of these behaviors. Step 3 is Enhancing Parental Attending Skills. Anastopoulos et. al. (1991) use the term "special time" in which parents must not interfere with the child's behavior and the parent must look at the behaviors in a positive manner. Parents realize that their children have more mild inappropriate behaviors that can be overlooked in order to focus on more problematic behaviors. Step 4 requires Paying Positive Attention to Appropriate Independent Play and Compliance. In step 4, commands used by parents are analyzed and positive communication used to increase the parents' effectiveness in gaining compliance from their child.

Step 5 moves to a new level where Home Token Systems are established. Rewards are used for compliance with the parents' first request and no penalty and only positive rewards are used during this phase to manage their child's behavior. Step 6 uses Response Cost and Time Out from Reinforcement, where penalty or punishment are first used by the parent toward the child. Tokens are removed for noncompliance and/or violations of household rules. In addition to the token economy, time out is implemented but only for excessive violations and there are only two to three violations for which time out should be utilized. Step 7, Extending Time Out to Other Misbehaviors, is an extension of Step 6, where parents who are comfortable and successful with time out begin using time out for two or three other violations. Step 8 involves Managing Children's Behavior in Public Places. Now parents are expanding away from the home and into other problem areas for the child. In this step parents use modified contingency management

systems where expectations are set with the child before leaving the home and the consequences for not meeting the expectations are acknowledged by the child. Step 9 revolves around Handling Future Behavior Problems where parents and therapist review the process they have used and discuss various ways to handle problems that may arise in the future. Step 10 is the Booster Session and held about one month after the completion of Step 9. During Step 10, rating scales and questionnaires are readministered to see what type of changes have occurred with the parents. Therapists generally review the process and set up additional booster sessions if the therapist deems it necessary to help parents effectively shape the child's behavior.

Parents and teachers are very effective in the carrying out and identification of problematic behaviors for children with attention deficit hyperactivity disorder. However, there is one group that can be just as influential in maintaining or decreasing problem behaviors, the child's peers. Landau and Moore (1991) suggest that "early disturbed peer relations predict premature dropping out of school, juvenile delinquency, job termination, bad conduct discharges from the military, police contacts, and psychiatric hospitalization" (235).

Social environment is that environment in which people communicate, establish relationships with one another, and form social groups. Landau and Moore (1991) suggest that children with disturbed peer relations are at a significant risk for later difficulties. DuPaul & Ervin (1996) suggest approaches to help children with ADHD effectively relate to their peers. The researchers suggest separation of ADHD children from preferred peers. Preferred peers are those children which have a significant impact on the

behavior, adaptive or maladaptive, of the child with attention deficit hyperactivity disorder. Instead, DuPaul et. al. (1996) suggest children with attention deficit hyperactivity disorder be placed with those children who are less likely to attend to the child with ADHD disruptions. Using this method, children with attention deficit hyperactivity disorder are able to exhibit their inappropriate behaviors, but will not be reinforced by their preferred peers. When appropriate behavior is used, the child will gain positive attention from the group and learn how to positively interact with peers. DuPaul et. al (1996) suggest task-relevant interactions among children, where attention from peers is incorporated into the interaction. Strategies such as cooperative learning and peer tutoring are examples of this type of interaction. Using peer tutoring may increase on-task behavior by the child with attention deficit hyperactivity disorder.

DuPaul and Henningson (1993) performed a case study using a peer tutoring intervention to increase on-task behavior and decrease task-irrelevant motor movement which are two behavioral hallmarks of ADHD. Their study used one male student, age 7, in a regular education second grade classroom. Peer tutoring as a process involves a student who is a tutor and the client in this case study as the tutee. During the regular classroom period, the tutor and tutee sit adjacent to each other and the tutor is provided with a "script" of academic material (e.g. math problems). Items from the "script" are given to the tutee, and the tutee responds orally to the presented items. Points are awarded based upon the tutee's initial, correct response, or by solving the presented item correctly three times in a row. Students then switch roles after a ten minute time period and the tutee becomes the tutor and vice versa.

DuPaul et. al (1993) found a significant increase in on-task behavior and a reduction in motor restlessness with this approach.

In the behavioral approach, treatments that are used tend to be the least stigmatizing of all types of interventions of children with attention deficit hyperactivity disorder. Treatments that will be most effective for children with attention deficit hyperactivity disorder are based upon assessments made by a multidisciplinary team. This team consists of parents, teachers, and other professionals who assess the behavior of one child. The most common assessment tools include rating scales, parent interviews, and direct observation by trained professionals, which may be done in natural or prearranged situations. Since these individuals assess the child, they should be held responsible for implementing and maintaining the child's intervention.

As the research reviewed has shown, responsibility of implementing and maintaining a child's intervention has focused primarily on the parents and teachers. As Anastopoulos et. al (1991) and Abramowitz et. al (1991) have shown, parents must go through a significant amount of training to effectively help their child, as well as themselves, cope with the disorder. This author believes that to effectively help a child with a disorder, parents should be the cornerstone of the treatment process. Parents must first start the child on the correct behavior path; once the foundation has been set in the home, behaviors will eventually carry over into the school and peer relations.

Parents and teachers are most willing to help the individuals with their treatment. Parents and teachers must have this type of commitment because they have the largest impact on the child, due to the fact that the child respects his/her parent and teacher, and because of their day to day contact. Whalen

et. al (1991) suggest a combination of teacher only or parent and teacher intervention using a token economy. This author believes that token economies can be an effective tool for children who are able to understand the process. However, too often a token economy is used with children who do not understand how they earn and spend tokens or they are just not interested in the economy structure. From the lack of understanding and lack of interest, the children with attention deficit hyperactivity disorder are not altering their behavior. Altering inappropriate behaviors of children with attention deficit hyperactivity disorder to appropriate behaviors is the goal of parents, teachers, and peers.

Peers have a significant impact upon the child with attention deficit hyperactivity disorder as shown in DuPaul et. al (1993). Peers have the potential for the most significant impact upon the child as they have more personal contact. Using the DuPaul et al (1993) approach is, according to this author, valuable for the future of children with and without attention deficit hyperactivity disorder. As the education profession moves more toward cooperative learning, children with attention deficit hyperactivity disorder must become accepted by their peers. Cooperative learning meaning multilevel ability grouping of children in which a topic is learned through a group learning process. Cooperative learning also involves each individual putting forth their knowledge to enhance the group's learning of the topic. As the DuPaul et al (1993) study shows, peer tutoring is affective in treatment. If this is true for a large portion of the attention deficit hyperactivity disorder population, classroom strategies such as cooperative learning and clustering will be successful. As long as target behaviors are identified, and proper

training is used, success for the child, parents, teachers, and peers will show significant improvement as evidenced in Anastopoulos et. al (1991).

Role of Medication in Treatment of Attention Deficit Disorder-Hyperactivity

Medication has been the primary form of intervention for attention deficit hyperactivity disorder (ADHD) (Mathes & Bender, 1997; Horn, Ialongo, Greenberg, Packard, & Smith-Winberry, 1990). Medications most commonly prescribed for intervention include, Methylphenidate (MPH; Ritalin), dextroamphetamine (Dexedrine), and pemoline (Cylert), with many more children receiving MPH than dextroamphetamine or pemoline (Pelham, 1991).

Medication has been the primary form of intervention because of its short-term efficacy in reducing a core of symptoms such as task-irrelevant activity, fine motor movement, being off-task during direct observation, and classroom disturbances (Richters, Arnold, Jensen, Abikoff, Conners, Greenhill, Hechtman, Hinshaw, Pelham, & Swanson 1995). Ialongo, Horn, Pascoe, Greenberg, Packard, Lopez, Wagner, Puttler (1993) agree with Richters et al (1995) that stimulant medication is highly effective in the treatment of the cardinal features of ADHD. However, Ialongo et. al (1993) go on to state that most children must remain on medication for long periods of time.

Medication affects biological functioning via the limbic system (site of emotion in the brain) to lower levels of inattention, impulsivity, and overactivity (Anastopoulos et. al, 1991). Through altering chemicals in the brain, mediation of the limbic system and the cerebral cortex (site of thought

and reasoning in the brain), medication as a treatment, has the goal of creating a better fit between the child with attention deficit hyperactivity disorder and the demands made on that child by the social environment (Anastopoulos et. al, 1991). This goal is achieved, because stimulant medication acts upon the limbic system to lower the threshold of sensitivity to reinforcement (Anastopoulos et. al, 1991). Therefore, medication effects on behavioral responses must be monitored.

Medication effects must be assessed before a final medication treatment is determined. Medication effects are defined as how specific medications alter the child's behavioral responses. DuPaul and Barkley (1993) offer that medication effects are measured by four areas. The first medication effects involve designing sequences where children are given different doses for a week at a time and behavior is monitored to find which dose is most effective. Second, using parent and teacher ratings across doses to find which dose was seen as most effective. Third, looking at side effects across the different doses, which also includes when the child is not being medicated. Lastly, the physician and psychologist both must maintain open communication during and after trials to establish optimal level focusing around children's behavior.

Medication is used primarily to influence children's length of attention and help the child control their behavior. Whalen & Henker (1991) state that when stimulant medications are effective, immediacy effects occur in the realms of compliance and concentration. Abikoff (1991) agrees with Whalen et. al. (1991) that psychostimulant treatment of children with ADHD has been reliably associated with significant short-term enhancement of sustained

attention, self-control, interpersonal behavior, and academic performance.

Medication interventions are most effective during middle school (Whalen & Henker, 1991). Maximum medication effect is important to the success of the child in the realm of concentration and compliance.

With Methylphenidate and dextroamphetamine, maximum effects are observed on the first day they are administered. With this rapid maximum effect, there is no chance for build up of medication in the child's system (Pelham, 1991). A significant benefit of these maximum medication effects include the ability to quickly impact interpersonal behaviors. If the medication has no impact on behavior, it is easily reversible with little to no long-term effects (DuPaul & Barkley, 1993).

Whalen and Henker (1991) caution that even though medication is used most often to help students control their behavior, it is difficult to predict who will respond to the medication and when. Under what conditions and in what manner will the individual responds is also a concern expressed by Whalen et.al (1991). Richters et. al (1995) agree that evidence suggests that dose responses may vary as a function of the domain of child functioning being studied.

Since dose responses of medication may vary from child to child, single-subject design methodologies should be used to evaluate medication effects (DuPaul & Barkley, 1993). Using single-subject designs may ensure behavioral changes have occurred across several environments, which is critical to assessing the effectiveness of pharmacology on children. DuPaul & Barkley (1993), in a review of the literature upon individual differences in medication responses, found that a study of three male children gave insight

into the difficulty of finding an “optimal” dose of medication. DuPaul & Barkley (1993) identified several different measures to determine the “optimal” dose through their review. Those measures included teacher ratings, behavioral observations, work completion rates and task accuracy on independent assignments at three different medication levels. A double-blind, placebo-controlled design was used where children received four active methylphenidate doses consisting of 5 mg, 10 mg, 15 mg, and 20 mg respectively. Results indicated that attentional and behavioral improvements resulted as a direct function of increasing doses of medication. The researchers found that each of the three males functioned best at different medication levels. Most importantly for these children was that the number and severity of side effects did not change for them at their optimal dosage level. Using the multiple assessment scales outlined above, it is apparent that single-subject designs should be used for the assessment of children and their medication.

Children should begin to be cycled off medication around adolescence, as stimulant medication usually retains usefulness through adolescence but not through adulthood (Reeve, 1990). By age eighteen children must be completely off medication because opposite effects begin to occur. Instead of keeping the child sedated and able to control their behaviors, the medication arouses them and they become less able to control the behaviors (Medication Manager, 1994).

Pelham (1991) suggests that instead of engaging in inappropriate behaviors, children with ADHD medicated with stimulants spend more time on task and complete more of their assigned academic work, often with

increased accuracy. Whalen and Henker (1991) agree that when medication is used effectively, concentration and compliance issues are resolved more immediately. Richters et. al. (1995) suggest that some ADHD children may possess the requisite social and academic skills but they experience difficulties in exercising those skills due to the core symptoms of inattention, distraction, and impulsivity.

Many side effects of early medication have been found with Methylphenidate, cyllert, and pemoline. Common side effects of MPH include nervousness, insomnia, tachycardia, nausea, and dizziness (Medication Manager, 1994). Other side effects are appetite suppression, involuntary tics, and cardiovascular changes which are generally short lived and dose-related. Side effects have the capability of being reversed as the child is gradually taken off of the medication (Whalen & Henker, 1991).

In addition to the side effects of medication, the limitations of medications must be considered. Medication, being widely used to help children control behavior, is limited in flexibility. Flexibility of medication is difficult, because once a certain medication level is found, changing the dosage can be hazardous to the success of the child in and out of the classroom as shown by DuPaul et. al (1993). In this authors (Larson) experience with children diagnosed having attention deficit hyperactivity disorder, changing medication dosage even five milligrams has a large effect on the behavior of the child. Dosage adjustments, however, are the only form of monitoring that can be adjusted in this type of treatment (Whalen & Henker, 1991). In this authors experience, adding five milligrams made the child lethargic, tired, noncompliant when cycled off the medication, and the

child appeared to have little control of themselves behaviorally. In subtracting five milligrams, the child was completely opposite in their behavior. The child still felt out of control behaviorally, however, the behaviors increased and became elevated.

Role of Cognitive Therapy on Attention Deficit Hyperactivity Disorder

Cognitive therapy focuses upon how a child thinks and processes information. Cognitive therapy differs from other forms of therapy in that active participation by the child is required in the treatment process. Being active participants requires children to become more aware of their own responses to academic tasks and social problems (Mathes & Bender, 1997). In order to become more active in their treatment process, training of the children must occur in self-monitoring and cognitive skills.

Children with attention deficit hyperactivity disorder (ADHD) generally are trained in the following formats: self-monitoring, self-reinforcement, cognitive skill training, self-instruction, and problem solving Abikoff (1991) and Abramowitz et al (1991). Within these formats, cognitive therapy may involve the use of modeling, role playing, self-reinforcement, social skills training, response cost, or coping skills according to Whalen et. al.,(1991). Cognitive interventions will focus upon self-monitoring as well as self-reinforcement techniques for the child with attention deficit hyperactivity disorder.

Self-monitoring strategies, according to Abramowitz et. al (1991), involves teaching children to observe their own behavior. Self-monitoring has been associated with increases in appropriate behavior in the academic and

social areas. Typically, self-monitoring strategies are taught at the conclusion of token reinforcement programs to maintain the behaviors targeted by the child, parent, and teacher.

According to Abikoff (1991), the central goal of cognitive training is to develop self-control over those behaviors which attention deficit hyperactivity disorder children exhibit most problems. In order to develop self-control, a major method of modifying impulse responses is to use self-instructional statements (Abikoff, 1991). Self-instructional statements come from interpersonal problems; when they arise, the child thinks of several types of alternatives and evaluates the consequences and alternatives and chooses the best solution (Abikoff, 1991).

Self-instruction is a fundamental part of many cognitive-behavioral interventions (Abramowitz et. al, (1991)). Steps used by Abramowitz et. al, (1991) in self-instruction include the child repeating aloud the instructions given to him/her. This process solidifies the expectation placed upon the child and helps the child reason out and describe the task to be performed which is step 2 in the process. Thirdly, the child verbalizes how he/she might attempt the task and think about the consequences of that chosen approach. Once consequences are chosen, deciding how to proceed and performing the task are required. Lastly, evaluation of the child's decision after the task has been completed, finishes the self-instruction method according to Abramowitz et. al (1991). Throughout the use of this self-instruction intervention, children are taught, through modeling and rehearsal. Modeling and rehearsal teach children how to verbalize the way they are going to solve a task. As the child

uses verbalization, over time the verbalization should move from external talk to internal talk, therefore diminishing external verbalization altogether.

Meichenbaum (in Liebert and Spiegler, 1994) supports the self-instructional training used by Abramowitz et. al, (1991). Meichenbaum describes five steps that teach children to instruct themselves on how to act, feel and think through situations. The steps used by Meichenbaum are *Cognitive modeling* where an adult describes out loud his/her thought process as to how to solve the problem at hand. Secondly, Meichenbaum uses *Cognitive participant modeling* where the child performs the task and the adult says the instructions. Third, *Overt self-instruction* is used by the child to verbalize the instructions without the adult saying them. Next, *Fading the overt self-instruction* takes place. The child still verbalizes the task, but the child whispers the instructions rather than saying them in a normal tone of voice. Lastly, *Covert self-instruction* takes place when the child says the instructions internally while performing the task. Meichenbaum suggests that the first attempts at this intervention should be focused on brief, simple, perceptual tasks like coloring. As the child masters the intervention, more difficult tasks should be utilized.

Self-reinforcement involves setting goals for oneself and then rewarding oneself for reaching these goals. Blonk, Prins, Sergeant, Ringrose, and Brinkman (1996) performed a cognitive-behavioral group therapy study upon 102 children, 68 males and 34 females, aged 8-12 years. These researchers used social skills training to alter children's peer relationship problems using self-efficacy measures. Training methods used by the researchers include modeling, behavioral rehearsal, instructions, group

discussion, feedback, and token reinforcement. Children were given a token for completing homework assignments, once children accumulated six tokens, they would receive a reinforcer. Self-reinforcement was measured using the Negative Self-Evaluation Scale in which children answer questions about themselves. Some of the questions the researchers looked at were “I’m a good-looking child,” “Other children like me,” and “I’m doing everything wrong.”

Blonk et. al (1996) found an increase in reciprocal choices and general acceptance for the children in the treatment group. Therefore self-reinforcement is successful for peer relationships for children. Peer relationships were maintained at follow-up which shows great promise for self-reinforcement interventions for children. On the negative self-evaluation follow-up, significant decreases in negative self-evaluation were found. The limitation of this study is that the study does not focus specifically upon children with attention deficit hyperactivity disorder, however, it does focus upon internalizing and externalizing conditions which are found within the ADHD population.

Implications Using Multimodal Therapy with Attention Deficit Hyperactivity Disorder

In a review of the interventions for children with attention deficit hyperactivity disorder (ADHD), Mathes & Bender (1997), concluded that intervention for on-task behavior using pharmacological and cognitive-behavioral means were more effective than when pharmacological intervention was used alone.

Self-monitoring is a cognitive intervention that uses a stimulus outside the child to solicit a response based on the child's level of attention. Mathes et al (1997) used a self-monitoring intervention in conjunction with a pharmacological intervention on 3 male elementary school children diagnosed with ADHD in a special education classroom. Pharmacologically, two of the children received methylphenidate and one received pemoline. The children's cognitive intervention involved a self-monitor tape and self-monitoring sheets. The tape contained tones that were to be unexpected by the subjects and averaged about 45 seconds between tones. When the students heard the tone they were required to ask themselves if they were paying attention to their task. Based on the level of paying attention, the children checked either yes or no on their self-monitor sheet and then returned to work. Parameters established for the on-task behaviors were explained to the children by the teacher. These on-task behaviors were defined by Mathes et. al (1997) as looking at the appropriate lesson materials (i.e. worksheets, blackboard, self-monitoring sheet, or teacher). Teachers, therefore, played a significant role in helping the children understand their behaviors as on-task or off-task as well as explaining equipment and materials the students would be using.

Teachers played a significant role within this study as they were required to perform the training and intervention of the program. However, the most significant role was placed upon the students as they were required to perform the actual behavior monitoring. Results indicated that there was an increase in on-task behavior for all three subjects. The researchers concluded that self-monitoring is an effective procedure for increasing attentional behavior above and beyond the gains typically associated with

pharmacological interventions (Mathes et. al., 1997).

Mathes et. al (1997) stress that self-monitoring interventions can easily be implemented by general education teachers as well as special education teachers as they work with students who are diagnosed ADHD. This type of intervention, according to the researchers, is practical for teachers with respect to time constraints. Self-monitoring is more student-directed and does not require changing lesson plans or teacher management of inattentive behavior. A child who receives medication as well as cognitive-behavioral therapy has the ability to recognize and alter his/her behaviors with greater success than those children who receive only one form of therapy (Mathes et. al, 1997).

According to DuPaul and Barkley (1993), treatment of children with ADHD has been improved by combining medication with behavior methodology. Pelham, Carlson, Samas, Vallano, Dixon, & Hoza (1993) studied behavior modification combined with pharmacological interventions on 31 males diagnosed with ADHD, ages 5-10. Structure of the behavior modification / no behavior modification was divided into alternating, week long periods. Behavior modification used in this study focused around a point system in which both reward and response-cost components were used. During the behavior modification week, each child received a certain number of points at the beginning of each class period. Loss of points focused around classroom rules and rewards came from completion and accuracy of academic assignments. No behavior modification weeks represented a normal classroom setting, and the classroom structure remained the same as during behavior management time.

A double-blind, placebo-controlled clinical medication assessment was used for the study. Pelham et. al. (1993) found that a combination of behavioral modification and pharmacotherapy were more successful than either form individually. Eleven of 27 males in this study showed an increase in behavior control using the combined intervention program of behavior modification and pharmacotherapy, compared with medication alone. Twenty one of 27 males showed an increase in behavior control using the combined intervention program of behavior modification and pharmacotherapy versus those that received behavioral intervention only. The researchers therefore concluded that combined interventions in classroom settings are clearly better over either intervention alone.

Limitations of this study involve lack of long-term efficacy of combined treatments using behavioral and stimulant therapy. Pelham et. al (1993) suggest that research is needed in this area. These researchers also suggest that there may be two forms of ADHD, one which is biologically based and one that is environmentally based. In biologically based ADHD children, the researchers state that medication may help children control their behavior. In environmentally based ADHD cases, children may benefit from strictly behavioral approaches.

Horn, Ialongo, Greenberg, Packard, and Smith-Winberry (1990) used a combination approach focusing around self-control therapy and parent training therapy to affect behavior of children with ADHD. Sixty children, aged 7 to 11, in the study; 18 children were control subjects and 42 children were referred for chronic inattentiveness, impulsivity, and overactivity. Participants were placed into a total of four intervention groups; parent

training alone; self-control therapy alone; parent training and self-control therapy; and lastly a control group which had no ADHD symptomology and received no treatment.

Problem-Solving Plans were used with children who received the self-control therapy. These plans required children to ask themselves a series of questions following self-instructional steps. These questions revolved around the identification of the problem the child is experiencing and how many solutions the child can find to solve the problem. Once solutions have been identified, a choice was made by the child as to which solution would be most effective. In addition to the questions the child would ask himself/herself, relaxation techniques were also used by the children to help calm themselves whenever they felt tense. Role playing and modeling were used to help children understand their personal Problem-Solving Plans.

Parent training consisted of teaching parents how to apply social learning theories to managing children's behavior. Training consisted of discussions, role playing, and didactic presentations. Parents were also given weekly homework assignments consisting of reading a book and individualized behavior management projects with their children. Parent topics included positive reinforcement, mild punishment, relationship enhancement, compliance training, and contingency contracting.

Horn et. al (1990) used the Child Behavior Checklist (CBCL) to measure the treatment effect as the combination of parent and self-control therapy. Using the CBCL as a measure, the research illustrates statistically significant pretest-to-posttest and pretest-to-follow-up improvement on the CBCL Hyperactivity scale. The greatest impact this study has to the research

is that in a follow-up assessment with the subjects, those that received the combination treatment improved to the point where they were not significantly different from children without attention deficit hyperactivity disorder based upon the Piers-Harris Self-concept scales. Combination therapy in this study did not focus around medication like most of the research found in the literature.

Ialongo, Horn, Pascoe, Greenberg, Packard, Lopez, Wagner, and Puttler (1993) assessed the effects of pharmacotherapy with behavior treatment on 117 children, ages 7-11 years. These children were referred due to chronic inattentiveness, impulsivity, and overactivity, and were then assessed for the presence of attention deficit hyperactivity disorder. One hundred and seven children (77% male) met the criteria for the ADHD diagnosis. Interventions used included parent training and self-control training in an exact replica of Horn et al (1990).

Medication-placebo therapy was used with all of the children in this study. The children were assigned to one of three medication conditions. These conditions were placebo, in which no medication was given to the subject, low-doses of Methylphenidate, or high-doses of Methylphenidate. Medication was dispensed in a double blind fashion, with side effects monitored by a board certified pediatrician.

Results from this study show that parents benefited the most from the parent training plus child self-control instruction conditions. Parent and teacher ratings of the cardinal traits of ADHD showed significant increases. As the ratings of the cardinal traits increase, parents and teachers are able to focus their attention upon those behaviors that are most deviant from what is

expected from children without attention deficit hyperactivity disorder.

Ialongo et. al (1993) suggest that results on the parent training strategy may be due to expectancy effects of the parents and not due to the actual child's behavior changes. Parents are wanting to see a change in their children, when behavior traits are identified as cardinal, there is a heightened awareness upon those traits. Since the parents awareness is what has changed, children's behaviors actually may not have changed since the beginning of the study. However, at follow-up, at least one-fourth of the children in the combined condition maintained the improvements shown in the initial intervention. With this consistant improvement over time, the results were not due to expectancy effects, instead they are based upon the child's actual behavior.

Chapter 3 Implications for Children with Attention Deficit Hyperactivity Disorder

Multimodal therapy is coming to the forefront of research to assist children with attention deficit hyperactivity disorder. Multimodal therapy uses several paradigms to help children gain control of their behavior. Research reviewed by this author included pharmacological, cognitive-behavioral, behavior modification, parent training, and self-control therapy. Combinations that can be used with these paradigms need to be found which best suit the child with attention deficit hyperactivity disorder.

Medication is the main therapy that has been used in most of the research. Medication is primarily used in intervention because it has the possibility of immediacy effects (Whalen et. al, 1991). Immediacy effects are desired by all levels of the multidisciplinary team, which includes parents,

teachers, and trained professionals. Using medication may be desirable to quickly impact a child's behavior, but multidisciplinary teams must keep in mind that medication may not always be the best form of intervention for the child. As Whalen et. al (1991) caution, it is difficult to predict who will respond to the medication and when.

Different settings elicit different behaviors and alter the rates at which the behaviors occur. For children with hyperactivity, properties within the settings (i.e. tasks) set the stage for behavioral changes (Zentall, 1993). Whalen et. al (1991) agree with Zentall (1993) in that the conditions may change the effect of the medication on the child's behavior. Citing these conditions, single-subject designs should be used according to Richters et. al (1995). Single-subject designs will give a better understanding of the child's behavior as the child moves from one setting to another.

One setting important to children is education. In the educational setting, children with ADHD need stimulation for those tasks that are overly familiar or repetitive. Reeve (1990) gives several classroom strategies to use with children who have attention deficit hyperactivity disorder, and the suggestions he offers can be used with any of the interventions discussed above. Suggestions made by Reeve (1990) include, providing as much structure and routine as possible and if unexpected situations are going to occur, a teacher should give the child with ADHD advanced warning and describe to the child appropriate behaviors in advance. Teachers should give children with attention deficit hyperactivity disorder extra time to work on assignments or exams. Lastly, Reeve (1990) suggests that regular feedback and praise are critical for ADHD children success.

Future research should focus attention upon multimodal therapy involving family, school, and the child. Studies such as Horn et. al (1990) do not use pharmacological interventions, instead, the researchers chose to help children accomplish tasks by modifying and changing their own behavior. Studies should focus less upon medication and more upon behavioral and cognitive interventions. Most studies being written are focused upon medication and some other type of intervention (i.e. behavioral or cognitive). Future studies should be focused upon combining several nonmedication strategies instead of using medication as the central focus for intervention.

Other researchers, such as Mathes et. al (1997); Pelham et. al (1993); and Ialongo et. al (1993) feature behavioral interventions in addition to pharmacological interventions. This is where the bulk of research will come from in the future due to the overreliance of medication to control impulsivity and behavioral misconduct with children with attention deficit hyperactivity disorder.

The challenge of future research will be to find children diagnosed with ADHD who are unmedicated. Once these subjects are identified, researchers must use the same behavioral strategies imposed upon medicated subjects to find if there is a significant difference between the populations. Identification of the differences between medicated and unmedicated subjects is critical to help professionals move away from the quick reliance upon medication as the first alternative to controlling behavior.

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